

REMARKS

Claims 1-10 and 12-19 are pending in the application. Claims 2, 3, 9, and 15-19 have been cancelled from the application. New claims 20-26 have been added by this amendment. Therefore, claims 1, 4-8, 10, 12-14, and 20-26 are at issue.

Claim 1 has been amended to incorporate the features of claims 2 and 3, and to delete the recitation of natural fibers from the claim. The features cancelled from claim 1, i.e., natural fibers, are now recited in new claim 20, together with features of claims 1 through 3. Claims 4, 6, and 7 have been amended to correct the dependency of the claims in view of the amendment to claim 1. Claim 8 has been amended to incorporate the features of claim 9 and to insert features from page 23, lines 1 and 2, of the specification.

New claims 20-26 are supported by original claims 1-7 and the specification at page 23, lines 1 and 2, and page 26, lines 25-27.

The present invention is directed to superabsorbent foams prepared from a crosslinked, partially neutralized acid-functional polymer or a crosslinked basic polymer. The superabsorbent foam further comprises (a) superabsorbent synthetic fibers (claim 1), for example, an isobutene-maleic anhydride copolymer (claim 6) or (b) natural fibers selected from apple fiber, orange fiber, tomato fiber, wheat fiber, oat fiber, or mixtures thereof. The present superabsorbent foams are flexible. The flexible superabsorbent foams are used, for example, in hygiene articles, such as diapers. Unexpectedly, the superabsorbent foams demonstrate an improved wet strength, as discussed more fully in connection with the art-based rejections of the claims, without adversely effecting the flexibility of the superabsorbent foam. In particular, it has been found that the wet failure value of a present superabsorbent foam is improved, without an adverse effect on foam flexibility, by the incorporation of a low weight amount of a claimed fiber into the foam.

Claims 1-7, 11, 13, 14, 17, and 18 stand rejected under 35 U.S.C. §103 as being obvious over WO 00/52087 (WO '087) in view of Le-Khac U.S. Patent No. 4,813,945 ('945) and Brueggemann et al. U.S. patent No. 6,033,769 ('769). The basis of the rejection is that WO '087 discloses superabsorbent foams, the '945 patent discloses superabsorbent

particles, and the '769 patent discloses that synthetic fibers enhance the mechanical stability of foams, which thereby render the present claims obvious. Applicants traverse this rejection.

First, claims 17 and 18 have been cancelled thereby rendering the rejection of these claims moot. Second, applicants note the examiner's comments regarding the English language equivalent of WO '087. Accordingly, applicants refer to WO '087 and Hähnle et al. U.S. Patent No. 6,750,262 ('262) interchangeably in this response.

Prior to addressing the present rejections, the U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness under 35 USC §103 is determined by: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

Furthermore, to establish a prima facie case of obviousness, the examiner must satisfy three requirements. First, as the U.S. Supreme Court very recently held in *KSR International Co. v. Teleflex Inc. et al.*, 127 S.Ct. 1727 (2007), "a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. ...it [may] be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was *an apparent reason* to combine the known elements in the fashion claimed by the patent at issue. ...it can be important to *identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements* in the way the claimed new invention does... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." (emphasis added, *KSR, supra*). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *Amgen Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Lastly, the prior art references must teach or suggest all the limitations of the claims. *In re Wilson*, 165 USPQ 494, 496 (C.C.P.A. 1970).

WO '087 (the '262 patent) discloses the preparation of superabsorbent foams from monoethylenically unsaturated monomers containing acidic groups. As stated by the examiner, the '262 patent *fails* to teach or suggest including any fibers, superabsorbent or natural, in the superabsorbent foam. WO '087 also provides no apparent reason or incentive to incorporate a fiber into a superabsorbent foam. In addition, applicants recognized that the WO '087 failed to disclose the incorporation of fibers and compared inventive superabsorbent foams to a foam of Example 1 of WO '087 (see specification, pages 39-41), discussed more fully hereafter.

The '945 patent is directed to superabsorbent copolymers that can be prepared as fibers. However, the '945 patent specifically teaches that the water-absorbing composition can be processed "into any desired form", as disclosed at column 5, lines 34-51 of the '945 patent. The '945 patent however is completely silent with respect to superabsorbent foams. The '945 patent therefore teaches no more than a water-absorbing polymer that can be prepared in various product forms, including fibers, and used in hygiene articles.

The examiner's contends that it would have been obvious to include the superabsorbent fibers of the '945 patent into a foam of the '262 patent. However, the combination of cited references provides no apparent reason for a person skilled in the art to make this jump in reasoning. The examiner apparently is relying solely upon a reasoning that the claimed combination is obvious because the two cited references are both in the field of superabsorbent polymers and each discloses one recited feature of the claims.

The Supreme Court recently identified a number of rationales that may be used to support a conclusion of obviousness, consistent with the framework set forth in its decision in *Graham v. John Deere Co.* See *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1739-40 (2007). These and other representative rationales are described at MPEP §2143 (8th Ed., Rev. 6, Sept. 2007). Regardless of the supporting rationale the Patent Office must clearly articulate facts and reasons why the claimed invention "as a whole" would have been obvious to a person at ordinary skill in the art at least as of the claimed invention's effective filing date. See *KSR Int'l*, 127 S.Ct at 1741 (citing with approval *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational

underpinning to support the legal conclusion of obviousness.")); see also MPEP §2143 ("The key to supporting any rejection under 35 USC §103 is the clear articulation of reason(s) why the claimed invention would have been obvious.").

To reach a proper determination under 35 U.S.C. §103(a), the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to the person. Knowledge of applicants' disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search, and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicants' disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the *facts* gleaned from the prior art. MPEP §2142.

The rationale relied upon by the examiner apparently is as follows:

"A. Combining Prior Art Elements According to Known Methods To Yield Predictable Results

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Then, Office personnel must articulate the following:

(1) a finding that the prior art included each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;

(2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately;

(3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention. "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art." (*Fed. Reg.*, Vol. 72, No. 195, page 57529 (October 10, 2007)).

It is submitted the combination of WO '087 and the '945 patent fails to meet reasons (2) and (3) above, and therefore "this rationale cannot be used to support a conclusion" of obviousness. In particular, as discussed below, the examiner has not articulated or identified any reason that would have prompted a person skilled in the art to combine the independently disclosed elements of the claims and incorporate superabsorbent fibers into a superabsorbent foam. For example, why would a person skilled in the art consider adding superabsorbent fibers to a superabsorbent foam? Further, the present invention provides results that could not have been predicted by persons skilled in the art.

The examiner relies upon the '769 patent for the motivation to include fibers in a superabsorbent foam. However, the '769 patent does not overcome the deficiencies of the combination of WO '087 and the '945 patent. The '769 patent is relied upon based on a disclosure that incorporating fibers in an absorbent foam enhances the mechanical stability of these foams. However, the layer structure of the '769 patent is substantially different from the presently claimed superabsorbent foams. The '769 patent also is directed solely to increasing mechanical stability of a foam by the addition of a fiber, with no teaching, suggestion, or hint that wet strength of a superabsorbent foam would be improved. Further, as demonstrated below, the mechanical stability provided by a fiber addition of the '769 patent adversely affects flexibility.

In particular, the '769 patent is directed to a layered structure for absorbing liquids. The structure contains layers of a *water-soluble* polymer foam (not a superabsorbent polymer as claimed). The structure further has a particulate (not fibers) superabsorbent polymer applied on the water-soluble polymer foam layer. The '769 patent goes on to disclose that fillers can be added to the water-soluble foam layers to provide "mechanical stability". No filler disclosed in the '769 patent at column 4, lines 35-44 is a superabsorbent fiber, and the '769 patent provides no apparent reason to add superabsorbent fibers to a superabsorbent foam.

The '769 patent contains Example 9 (a/b) at column 8 which demonstrates the effect of including a filler in a foam of water-soluble polymer. The inclusion of a filler provides a "somewhat flexible material" indicating that a filler adversely affects the flexibility of the foam. Example 10 of the '769 patent at column 8 teaches that the inclusion of a chalk filler provides a brittle sheet material. Such a brittle material is unsuitable for a hygiene article. Further, a person skilled in the art desiring to *maintain* foam flexibility would *avoid* including a fiber in a foam after reading the '769 patent.

The '769 patent therefore teaches persons skilled in the art, at most, that incorporating fibers into a foam increases mechanical stability, but at the expense of flexibility. This is contrary to the present invention wherein maintaining flexibility of the foam is desired, while simultaneously improving the wet strength of the foam. Unlike the '769 patent, which utilizes a *water-soluble* polymer, and therefore needs an additive to increase mechanical stability, the present claims do not require fibers for mechanical stability because the foam is prepared from a crosslinked superabsorbent polymer (which is not water soluble). The crosslinking provides sufficient structural stability. The fibers in the present invention are included to provide an improved wet strength.

The combination of WO '087, the '945 patent, and the '769 patent therefore teaches more than a possibility of adding a filler to a foam to increase mechanical stability. However, the '769 patent fails to disclose superabsorbent fibers or natural fibers as claimed, or to provide any suggestion that the addition of fibers to a claimed superabsorbent foam can increase wet strength. In addition, persons skilled in the art would have had no incentive to incorporate fibers into a superabsorbent foam for any reason other than mechanical stability.

It could not have been predicted from a combination of the references that including a claimed fiber in a superabsorbent foam (a) does not adversely effect flexibility *and* (b) also provides improved wet strength of the foam.

The claimed superabsorbent foams also demonstrate new and unexpected results over a foam of WO '087, which discloses a superabsorbent foam lacking a fiber. The examiner is particularly directed to Comparative Example 1 at page 39 of the specification, which was prepared according to Example 1 of WO '087.

The foam of Comparative Example 1 was compared to the foams of Inventive Examples 1-8, and the results are summarized in Tables 1 and 2 at pages 40 and 41 of the specification. In particular, Table 2 shows a very low Wet Failure Value (WFFV) for Comparative Example 1 compared to Inventive Examples 1-8, i.e., a present foam demonstrates improved wet strength. In addition, Comparative Example 1 has a substantially greater swollen foam thickness, which is a disadvantage because a thin hygiene article, after soiling, is an important feature for the user of the article.

For all the reasons set forth above, it is submitted that claims 1, 4-7, 11, 13, and 14 would not have been obvious over a combination of WO '087, the '945 patent, and the '769 patent, and that the present rejection should be withdrawn. For the same reasons, it is submitted that new claim 25 also is patentable over this combination of references. Furthermore, new claims 20-24 and 26 are patentable over this combination of references for the reasons set forth above and because the references fail to teach or suggest a claimed natural fiber for inclusion in a superabsorbent foam.

Claims 8-10 and 12 stand rejected under 35 U.S.C. over a combination of WO '087, the '945 patent, and the '769 patent. Applicants traverse this rejection.

Claims 8, 10, and 12 (claim 9 has been cancelled) are directed to a method for producing a superabsorbent foam containing superabsorbent synthetic fibers or natural fibers. The foam is prepared by adding the fibers to a monomer mixture, then polymerizing the monomer to incorporate the fiber throughout the foam.

The combination of references fail to teach or suggest the presently claimed method. WO '087 is directed to foams, but silent with respect to fibers. Conversely, the '945 patent discloses fibers, but is silent with respect to foams. There is no teaching, suggestion, or incentive to add fibers to a monomer mixture prior to polymerization. The '769 patent teaches preparing a foam of a water-soluble polymer from a preprepared polymer, i.e., a polyvinyl alcohol. Superabsorbent particles then are sprinkled on the foam. No filler material is admixed with a monomer solution, and no polymerization is performed in the presence of the filler material, see Examples of '769 patent.

Therefore, the presently claimed method is substantially different from the combined disclosure of WO '087, the '945 patent, and the '769 patent. The combination of references provides no apparent reason for a person skilled in the art to modify the teachings of the references in a manner to arrive at the presently claimed method. As discussed above, the references also fail to teach every claimed element. Accordingly, it is submitted that the rejection of claims 8, 10, and 12 under 35 U.S.C. §103 is error and should be withdrawn.

Claims 15, 16, and 19 also stand rejected under 35 U.S.C. §103 over a combination of references. Applicants have cancelled these claims for reasons unrelated to patentability, but to facilitate prosecution. Applicants reserve the right to file continuing applications directed to the subject matter of these claims. Accordingly, the rejection of claims 15, 16, and 19 is moot at this time.

It is submitted that the present claims are in a condition for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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